

On the Origin of Species. By CHARLES DARWIN, M.A.
8vo. 1859.

A few years ago the fashionable topic of discussion was whether there are other inhabited worlds than this earth on which we tread. A sharp controversy grew out of the discussion, the combatants being arranged in two bands, the advocates and the opponents of the doctrine of the plurality of worlds. Many learned and instructive books and essays were produced on both sides, and the victory remained undecided, if it were not on the side of the pluralists. However that may be, we now hear but little of this exciting controversy. We are met now by discussions on the origin and changes of the species of all existing and past animals and vegetables; under what primary forms they first appeared, the changes they have undergone, and the causes of those changes.

It is to Mr. Darwin that is due what reputation may accrue from having recently directed public attention in this direction. The work, the title of which stands at the head of this article, has attracted great notice from naturalists. It contains new views, or such modifications and extension of views that have lately gained some ground, that it cannot fail to arouse the reflecting mind to a consideration of the argument it is intended to support. The mass of facts it contains will create some surprise. The work itself is incomplete, being but the first instalment of an extended treatise.

To the student of natural history there are few subjects so perplexing as the determination of species. Species being in fact an abstract ideal, not a real and substantive form, we are not to be greatly surprised if we find naturalists at variance as to what particular species an individual animal or plant may belong. We do not say that there would be any difficulty to the merest superficial observer in classifying horses, dogs, cats, elephants, daisies, roses, or palm trees, but there are minuter forms and less obvious diversities which would render it less easy to determine whether they were specific differences or mere varieties, *e.g.*, the uninitiated would perhaps not classify roses with apples,—yet both are of one species. Although it may be contended that there is no such thing as a species, yet there is the idea represented by the word species, just as much as there is no *thing*, no concrete substance, which we can touch or handle, as material bigotry or prejudice, yet there is the clear and intelligible idea of the narrowness of mind which can approach to the consideration of no subject but in its own way, and will look at nothing but from its own point of view, according to the formula, "heterodoxy is your doxy, orthodoxy is my doxy." No one looks upon a horse, a dog, an elephant, a daisy, or a rose, as a species, but every one moderately acquainted with his own language understands what is meant by saying these are individuals of different species, and few indeed would be likely to confuse the specific characters of a gazelle with those of the hippopotamus. Active indeed must be the imagination that could conceive of any combination of circumstances by which the one should become transmuted into the other. Still there is nothing to disprove the possibility of such a metamorphosis in some vast and indefinite lapse of time. Analogy, however, is opposed to any such conclusion. The bones of animals, and the leaves and wood of trees, that are found in rocks and coal mines, present the same general features and the same minute structure as are exhibited in similar species now living and growing on the face of the earth; and yet, if time be an element in the change, surely we should have found variations. The identity of the species of cats, birds, beetles, and other animal and human remains found in the tombs of Egypt, is commonly cited as evidence of the immutability of species; but what are the few thousands of years that have elapsed since these were encased in stone, as compared with the myriads of thousands, yea, perhaps millions of ages, that have elapsed since these were consigned to their graves in the rocks.

The doctrine of the transmutationists, as expounded in Mr. Darwin's book, is that changes in external physical conditions affect the character of those species which are not well suited to resist those influences, and give rise to greater or less variations. That these influences, operating through incalculable periods of time, the few species able to resist them would survive; while the other, or feebler species, have become extinct; thus immense gaps have arisen and given rise to the theory of occasional new

creations. Controlled by the secondary law, some of the most durable older species would be found, together with the later forms, the intermediate links being missing because they were rare and transient. The persistence of exceptional births or developments, and the duration of varieties, is expressed by Mr. Darwin as being attributable to the law of "natural selection," by which expression he understands the modifying influence of external conditions.

It is obvious that if the question is to be discussed at all—and that it is a perfectly legitimate and reasonable discussion there does not exist a doubt—it must be discussed by the consideration of the answers to two questions:—

1. Have there, at various epochs in the history of our globe, been fresh evolutions out of inorganic matter.

2. Have the original stock or prototype become so modified by external conditions, that the new species have been evolved out of the old.

We believe that the cautious inquirer will, in the true inductive spirit, admit, after the most extended investigations, that these are questions which at present we have no means whatever of solving. At the same time we cannot but concede that while we hold the so-called theory of transmutation to be an imperfect hypothesis, it is more philosophical, than that which has recourse to the arbitrary interference of an occasional creative act. It is more in harmony with the attributes of omnipotence and omniscience to conceive a continuous creative power, or "principle of orderly evolution," than to suppose an interruption of the grand laws of the uniformity of nature,—an interruption so entirely at variance with all the phenomena of nature with which science has yet made us acquainted. The greatest generalisation of modern times, in natural history, has, in our estimation, been Owen's theory of the homologies of the skeleton, whereby the relations of the several parts of the skeleton throughout the whole vertebrate kingdom have been traced through modifications which would at first sight appear utterly irreconcilable. The homologies of living beings have, we suspect, been not unfrequently taken to be transmutations. Unity of plan, with infinite variety of detail, is the great marvel of nature's operations—the limitations of this varying requires yet to be determined before it can be supposed that we can trace backwards to any alleged prototype. Mr. Darwin draws largely upon his reader's imagination when he advances his opinion that all vertebrate animals (man, necessarily included) have been derived from some primary being, possessing simply a swimming bladder and lungs. The great Cuvier admitted the influence of external condition to modify structure, and had observed the transmission by descent of such varieties, but his genius never carried him off to so exalted a flight of imagination as Mr. Darwin has reached.

Much that has been said and written in favour of mutation of species, is drawn from the almost infinite varieties that are to be observed in the breeds of some domestic animals, such as dogs, pigeons, etc., etc. Much, however, as the first dog or the first pigeon may vary from the latest fancy article of either kind, still dogs they are as dogs they were, and pigeons they always have been and pigeons they will continue to be. The controversy, it seems to us, owes its existence pretty much to the defect of language. We are not determined, in very many instances, as to what is a species; we find it utterly impossible to give a satisfactory definition, or to point out an intelligible standard, and consequently there is little chance that naturalists will in all cases be agreed as to what is variety and what is species or sub-species, so gradually do these merge into one another, and so diverse is often the character of an individual at one period of its existence to what it may present at an earlier or later stage of its development.

The late Professor E. Forbes held that we have no means of knowing how the primary form or prototype of each species originated, but from his extensive researches and his profound acquirements in Natural History, he could arrive only at the conclusion that there had existed at some time "specific centres," i.e., centres in which were placed the types from which all plants or animals of each species have since descended.

The same author argues that we have no experience of the individuals of any species being produced otherwise than from individuals of its own kind. The instances which have been adduced as opposing this doctrine have been open to dispute. The mutationists place themselves in a like difficulty when they would refer all existing animals to some one prototype from which variations have arisen under the controlling or modifying influences of external circumstances. After all, the question of the origin of the prototype remains open.

As bearing upon this point, we quote the words of Professor Baden Powell. There is "a stage in the early evolution of every class and order, during which a community of form belongs to all. At this stage no differences exist between them; and out of this primitive germ or rudiment any one of the *many distinct specific forms* might, so far as we know, be equally produced, provided the determining causes for that particular modification were present. Of the nature of these specific determining causes nothing whatever is at present known."

Dr. J. D. Hooker is of opinion that the number of species has been needlessly and arbitrarily increased; that the wide limits of variation have been overlooked or restricted, that the real number of species is less than is often supposed, and that the alleged mutability of species is rather to be explained by modifications or varieties arising through long periods of time, and by the obliteration or extinction of others.

Mr. Darwin holds that all the varieties of organised beings with which we are acquainted have been owing to the struggle for existence, and the selection by nature of the best and strongest varieties, these last being perpetuated by descent. On this theory, it is obvious that as there have been, so there can be, no such thing as permanency of species.

But the existence, at the present day, of the simplest forms of animal or vegetable life, side by side with the most complex, and the identity of many ancient and modern forms, present difficulties to the theory of mutation.

If we pick up a piece of chalk, and carefully wash it, we resolve it into an impalpable white powder (carbonate of lime), and microscopic shells of great beauty, fragments of corals, spicules of sponges, and other marine remains.

If we purchase an entirely new piece of sponge, and shake out the sand and dust which it contains so abundantly, we shall find, if we place this under the microscope, that it contains the same kinds of shells, fragments of coral, intermingled with sand, instead of the white powder of carbonate of lime.

If we pick up a flint, and on the lapidary's wheel polish the surface, or a thin slice of it, we shall find on examination that it also contains, imbedded in its siliceous substance, a countless mass of spicules of sponge and microscopic organisms.

If we break the common gravel stones with which our high roads are mended, we shall find that in many of these are included shell, not only of microscopic dimensions, sponges, sea anemones, sea urchins, etc., of species similar to what are to be found in seas at the present time.

If we carefully sift the powdered substance which in some parts of the world constitutes entire rocks, or even whole mountains, we find these to consist mainly of the flinty skeletons of microscopic beings, in all respects the same as are now to be found alive in the mud of our rivers, ponds, and the banks of brackish tidal ditches and the depths of oceans.

Surely if lapse of time and force of external conditions be among the elements of the alleged mutation of species, we ought to meet with different structures in geological deposits which present an antiquity beyond the power of our conception, and circumstances of deposition seemingly so different from those of later date.

In bringing this subject under the notice of our readers, we have advisedly declined to treat it on theological grounds. The history of the origin of species, and of the origin of all things, so far as Holy Scripture propounds anything relating thereto, is contained in the few words with which the sacred volume opens:—"In the beginning God created," &c. All subsequent details not being delivered after the manner of a treatise on the natural history of creation, but as a solemn statement to the descendants of Abraham that God created all things; their one Almighty God Jehovah was the creator of earth and heaven, of celestial bodies, and terrestrial bodies, and that to worship any of these creatures in the place of the Creator, as was the practice of the benighted pagans around them, was to incur the anger of their King, who was also their jealous God. We believe that the Old Testament narrative of creation has no other end than this, to lead man to look to God and to prepare him for the glorious dispensation of the New Testament. We regard all the bitter and fierce disputations as to heterodoxy and orthodoxy as so much foolish waste of time and temper, as a total misconception of the purport of Scripture, which nowhere reveals what reason can guide us to discover. Where reason cannot lead us, revelation steps in and points the way. Man by reasoning never found out God, but man by reasoning did in all ages attain to knowledge of the laws of nature.